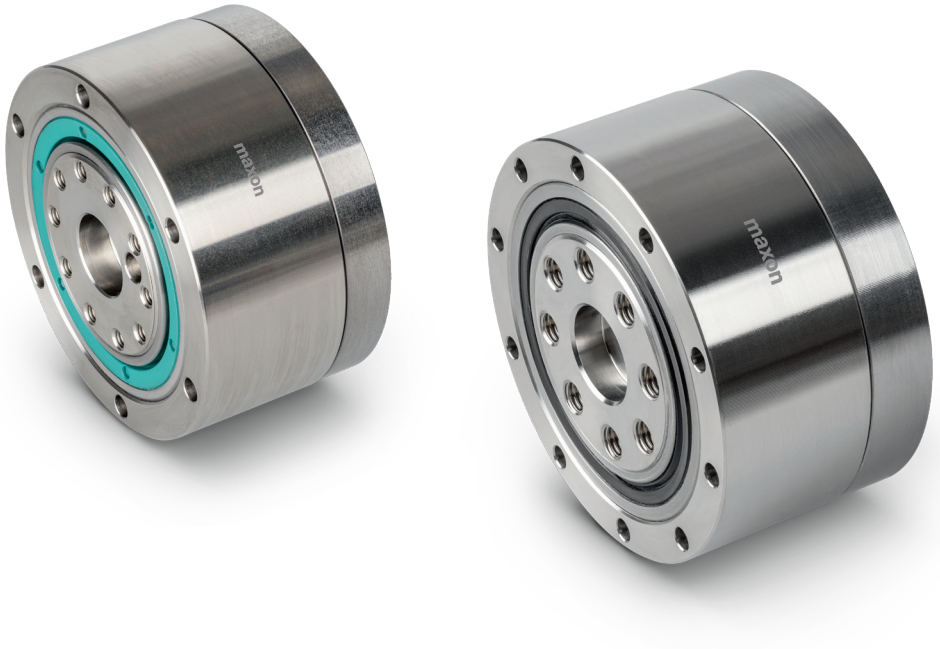
maxon

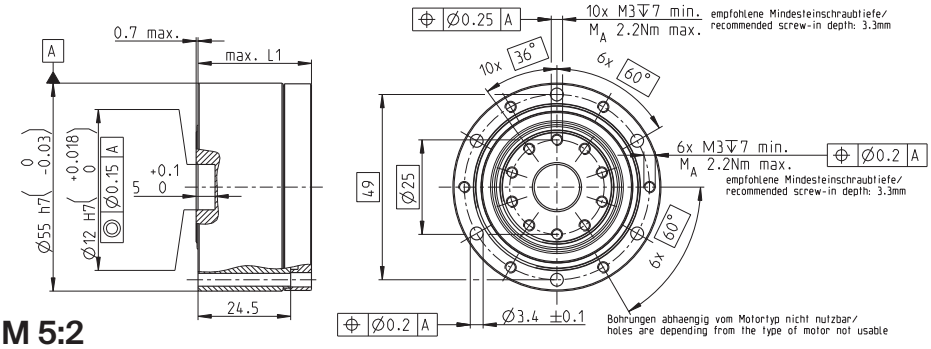
Strain wave gearhead – high-precision, compact, and efficient.



GSW 55 A ∅55 mm, strain wave gearhead

Zero backlash

NEW



M 5:2

Stock program
Standard program
Special program (on request)

			Part numbers		
			863427	863428	863429
Gearhead data					
1	Reduction		50:1	80:1	100:1
2	Max. continuous torque	Nm	4.8	7.7	7.7
3	Max. intermittent torque	Nm	12.0	16.0	19.0
4	Max. overload torque	Nm	24.0	35.0	35.0
5	Max. continuous input speed	rpm	3500	3500	3500
	Max. intermittent input speed	rpm	8500	8500	8500
6	Max. efficiency	%	72	72	75
7	Weight	g	300	300	300
8	Mass moment of inertia	gcm²	4.35	4.22	4.18
9	Gearhead length L1	mm	30.3	30.3	30.3
10	Mech. positioning accuracy	arcmin	1.50	2.10	2.40
11	Mech. repeatability	arcmin	0.01	0.01	0.03
12	Hysteresis loss	arcmin	2.50	2.00	2.00
13	Torsional rigidity C1	10^4 Nm/rad	0.29	0.44	0.33
	Torsional rigidity C2	10^4 Nm/rad	0.37	0.44	0.36
	Torsional rigidity C3	10^4 Nm/rad	0.47	0.48	0.45
14	Torque M1	Nm	1.58	1.58	1.58
	Torque M2	Nm	3.16	3.16	3.16
15	Starting torque, no load	Nm	2.20	1.60	1.40
16	Backdriving torque, no load	Nm	1.50	1.50	1.50
17	Ratcheting torque	Nm	60.0	75.0	55.0
18	Buckling torque	Nm	190	190	190

Technical data		
19	Bearing at output	cross roller bearings
20	Tilting rigidity	9.0 Nm/arcmin
21	Max. tilting torque	28.0 Nm
22	Max. radial load	1650 N
23	Max. axial load	3300 N
24	Dynamic load rating	1890 N
25	Static load rating	2140 N
26	Distance rolling bearing center to output	10 mm
27	Pitch diameter	34.7 mm
28	Ambient temperature	-40...+100°C

Additional information

Explanation of the line numbers and additional information on page 454.

Modular system

EC motor

263-265_ECX FLAT 42
306-311_EC-i 40
312-313_EC-i 52

Compact drive

365-366_ECX FLAT 42

Explanations of maxon terminology: Strain wave gearhead

Dimensional drawings
Presentation of the views according to the projection method E (ISO). All dimensions in [mm].

Mounting in plastic
Screwed connections on motors with plastic flanges require special attention.

M_A Max. tightening torque [Ncm]
A torque screwdriver may be adjusted to this value.

L Active thread depth [mm]
The relation of the thread depth to the thread diameter must be at least 2:1. The screw-in depth must be less than the usable length of the thread!

Gearhead data
Values are based on an ambient temperature of around 25 °C (known as cold data).

Gearhead data

1 Reduction ratio
The reduction indicates the ratio by which the speed of the gear output shaft is smaller than the motor speed.

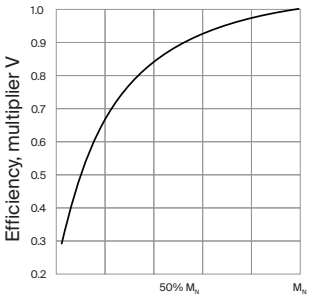
2 Max. continuous torque [Nm]
The continuous torque provides the maximum load permanently applied to the output shaft. If it is exceeded, the service life is significantly shortened.

3 Max. intermittent torque* [Nm]
The short-time torque is the maximum torque that may be output on the output shaft for a short period of time without damaging it.

4 Max. overload torque [Nm]
The maximum torque that may be applied for a short period of time without causing mechanical damage to the gearhead; for instance, in the event of a collision.

5 Max. continuous/intermittent* input speed [rpm]
It is based on service life considerations. If this value is greatly exceeded, the service life can be shortened, the gear heats up more and more noise is generated.

6 Efficiency [%]
The specified efficiency is a maximum value that applies under continuous torque load (M_N). Under very small loads, the efficiency decreases (by a factor of V).

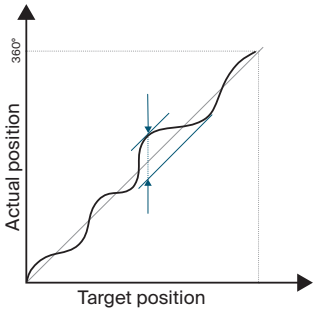


7 Weight [g]
The specified weight corresponds to the net weight, including motor add-on components.

8 Mass inertia [gcm²]
The gear moment of inertia is given at the motor shaft. It is required in order to calculate the additional torque needed for acceleration of the gear components in the case of highly dynamic drives. Variations may arise depending on how lubrication is distributed.

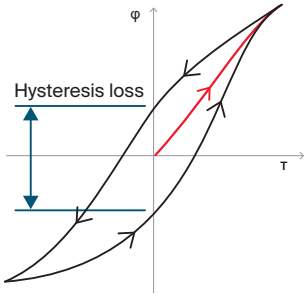
9 Gear length L1 [mm]
L1 describes the gear length down to the motor's axial mount area (reference C in motors).

10 Mech. positioning accuracy [arcmin]
The mechanical positioning accuracy describes the absolute positioning error at the output. It is measured over a full revolution (360°) at the output and shown as the maximum value of the bandwidth.

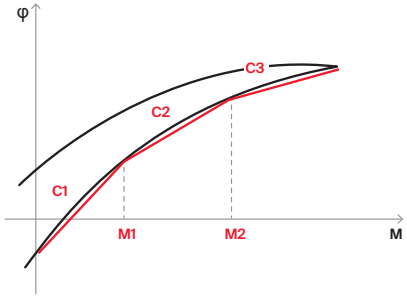


11 Mech. repeatability [arcmin]
The mechanical repeatability describes how accurately a position can be reached repeatedly from the same direction. It is defined as half of the maximum deviation and is expressed as a ± value.

12 Hysteresis loss [arcmin]
The hysteresis loss describes the angular deviation (φ) resulting from fluctuating loads on the output shaft (T). It is measured while the gearhead input is blocked.



13 Torsional rigidity [10⁴ Nm/rad]
The torsional rigidity describes the elastic deformation of the output under load. The torsional strength is presented in a linearized form, divided into three segments.
C1: up to torque M1
C2: between torque M1 and M2
C3: higher than torque M2



15 Starting torque, no load [Nm]
The starting torque specifies the torque that must be applied at the gearhead input to set the gearhead in motion. No load is applied to the gearhead output in this case.

16 Backdriving torque, no load [Nm]
The backdriving torque specifies the torque that must be applied at the gearhead output to drive the gearhead from the output side. No load is applied to the gearhead input in this case.

17 Ratcheting torque [Nm]
The ratcheting torque describes the torque during operation at which the tooth contact between the flexspline and circular spline is lost and the teeth slide over each other. This results in asymmetric tooth meshing. Continued operation leads to increased wear and tear, ultimately destroying the gearhead.

18 Buckling torque [Nm]
The buckling torque describes the torque at standstill at which the flexspline can plastically deform or even tear away from the base. The gearhead is irreparably damaged afterward.

Technical data

20 Tilting rigidity [Nm/arcmin]
The tilting rigidity describes the resistance of the output bearing to tilting.

21 Max. tilting torque [Nm]
The specified value only refers to the tilting torque without axial/radial load in a static condition.

22/23 Max. axial/radial load [N]
The specified value only refers to the axial/radial load without tilting torque in a static condition.

24/25 Dynamic/static load rating [N]
The load ratings are specifications for calculating the expected service life of the output bearing.

26 Distance rolling bearing center to output [mm]
This values describes the distance from the output to the center of the output bearing.

27 Pitch diameter [mm]
The pitch diameter describes the diameter of the circle along which the centers of the rolling elements move.

28 Ambient temperature [°C]
Specifies the permissible ambient temperature for proper operation of the gearhead. The gearhead properties depend on the ambient temperature. Special lubricants are available on request.

***intermittent**
Short-term operation is defined as follows:
– during 1 second
– during max. 10% of the operating cycle
If these values are exceeded, a reduced service life must be expected.